



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,658	01/24/2006	Masahiko Kubota	03500.102480.	5506

5514 7590 01/29/2010  
FITZPATRICK CELLA HARPER & SCINTO  
1290 Avenue of the Americas  
NEW YORK, NY 10104-3800

EXAMINER
----------

DAHIMENE, MAHMOUD

ART UNIT	PAPER NUMBER
----------	--------------

1792

MAIL DATE	DELIVERY MODE
-----------	---------------

01/29/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/565,658	<b>Applicant(s)</b> KUBOTA ET AL.	
	<b>Examiner</b> MAHMOUD DAHIMENE	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-10 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 10, 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claims, the term “positive type photosensitive material” is not associated with a heating temperature, and therefor, does not have support in the specification. The specification disclose “A **positive type resist composite** that contains the above-described copolymer of methacrylic acid and methyl methacrylate as resin elements is employed as a solid layer formation material. The baking temperature is 120 to 150.degree. C.” (page 44). The examiner notes that a **positive type resist composite** is not necessarily a **positive type photosensitive material** since the term resist can be applied to any masking material that prevents etching, the term resist usually refers to etch resistant materials not necessarily photosensitive, and, also, a positive type photosensitive material is not necessarily used resist material, The two expressions are not interchangeable.

Art Unit: 1792

Page 12, line 8 of applicant's specification disclose "a **positive type photosensitive composite**, the resin element of which is a copolymer of methacrylic acid and **methacrylate ester**" no heating temperature is associated with this compound.

Page 20, line 3 of applicant's specification disclose "A **positive type resist composite** that contains the above-described copolymer of methacrylic acid and **methyl methacrylate** as resin elements is employed as a solid layer formation material" is associated with a heating temperature.

### ***Claim Rejections - 35 USC § 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1792

3. Claims 1, 2, 3, 5-9, 12, are rejected under 35 U.S.C. 103(a) as being obvious over Kubota et al. (EP 1380422) in view of Uozumi et al. (US 2004/0214945) and a second reference of Kubota et al. (US 2004/0072107) herein referred to as Kubota' 107.

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Kubota et al. (EP 1380422) discloses a method of manufacturing a liquid discharge head comprising the steps of;

forming a solid layer (203) for forming a flow path on a substrate (201) on which an energy generating element (202) is arranged to generate energy that is used to

Art Unit: 1792

discharge liquid; forming, on the substrate where the solid layer is mounted, a coating layer for coating the solid layer (204);

forming a discharge port (209) used to discharge a liquid, through a photolithographic process, in the coating layer formed on the solid layer; and

removing the solid layer to form a flow path that communicates with the energy element and the discharge port,

whereby a material used for the coating layer contains a cationically polymerizable chemical compound (paragraph 0042) such as epoxy resin, cationic photopolymerization initiator (paragraph 0043) and

whereby a material of the solid layer that forms a boundary with a portion where the discharge port of the coating layer is formed contains a copolymer of **methacrylic acid (abstract) and methacrylate ester** (paragraph 0028), which must be present at all boundaries of the resulting material. The methacrylic copolymer composite mainly containing methacrylic acid where a methacrylic acid unit is 2 to 30 wt% and molecular weight is 5,000 to 50,000. Applicant's claimed range appears to overlap Kubota et al. (EP 1380422) disclosed ranges (abstract).

positive type photosensitive material layer (paragraph 0017)

Ionizing radiations are used at different wavelengths (paragraph 0018)

“a **cationically polymerized cured epoxy resin** offers excellent properties as a structure material because it has higher crosslinking density (high T<sub>g</sub>) compared with a cured product of acid anhydride or amine in a normal state” (paragraph 0043)

**Xylene** is used (page 8) (paragraph 0049).

“positive resist layer 204 is developed for pattern forming by immersing it into methyl isobutyl ketone” (paragraph 0084).

It is noted that Kubota is silent about the coating resin layer containing a cationically polymerizable resin and a basic material having a pair of non-shared electrons

Uozumi et al. (US 2004/0214945) teaches an epoxy resin containing cationically polymerizable composition that contain cationically polymerizable compounds and photopolymerization initiators are generally likely to thicken (paragraph 0007), and further teaches “methods for improving storage stability of oxetane compounds (which are cationically polymerizable compounds) and inhibiting the thickening and gelation of the compound caused by external factors such as heat: for example, a method in which p-methoxyphenol, hydroquinone, catechol, phenothiazine or cupferron is used as a thermal polymerization inhibitor, a method in which a **basic compound** is used, and a method in which a straight-chain or branched-chain **amine** is used” (paragraph 0009). The amine compound of Uozumi has a pair of non-shared electrons.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kubota to include oxetane compounds (which are cationically polymerizable compounds) and a basic compound such as an amine as the cationically polymerizable composition because Uozumi teaches such compounds are known to prevent thickening and gelation.

One of ordinary skill in the art would have been motivated to modify the process of Kubota to include oxetane compounds (which are cationically polymerizable

Art Unit: 1792

compounds) and a basic compound such as an amine as the cationically polymerizable composition in order to inhibit the thickening and gelation of the compound caused by external factors such as heat, which in turn reduce manufacturing cost for allowing a longer shelf life.

It is noted that Kubota et al. (EP 1380422) is silent about diglyme and a heating temperature of 120 to 150 degree C.

The second reference of Kubota et al. (US 2004/0072107) teaches diglyme is conventionally used for the same type of material with Methyl isobutyl ketone 100 parts by weight Diglyme 100 parts by weight (paragraph 0109). And “baking is preferably executed at a temperature of 120 to 220.degree.” (paragraph 0060) which overlaps applicant’s claimed range. Overlapping ranges are held obvious.

The second reference of Kubota et al. (US 2004/0072107) teaches methyl isobutyl ketone is conventionally used for the same type of material (paragraph 0062)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kubota et al. (EP 1380422) to include the diglyme of Kubota et al. (US 2004/0072107) because Kubota et al. (US 2004/0072107) teaches diglyme and methyl isobutyl ketone are conventionally used for the same type of material.

One of ordinary skill in the art would have been motivated to modify the process of Kubota et al. (EP 1380422) to include the diglyme and methyl isobutyl ketone of Kubota et al. (US 2004/0072107) in order to allow easy application of the material onto the substrate as suggested by Kubota et al. (US 2004/0072107).



***Claim Rejections - 35 USC § 103***

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being obvious over Kubota et al. (EP 1380422) in view of Uozumi et al. (US 2004/0214945) as applied to claims 1 and 3 above, and further in view of Ikeda et al. (US 5,523,383).

It is noted that the cited prior art is silent about the heating temperature as required in applicant's claim 10.

Ikeda discloses a photocurable resin wherein "The binder polymer serves to shape the resin composition into a film and may mainly be an acrylic polymer which is prepared by the copolymerization of acrylic acid, an acrylate ester, **methacrylic acid**, a **methacrylate ester**, styrene etc. and has a molecular weight of several tens of thousand" are conventionally used as resin (column 1, line 57). Also "After the development, the remaining coating may be post-cured by the irradiation with UV rays or at a temperature of 120.degree. C. or above to thereby improve the resistance of the coating to etching." (column 10, line 10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kubota by heating the photosensitive material at a temperature of 120.degree. C. or above to thereby improve the resistance of the coating because Ikeda suggests such a step.

One of ordinary skill in the art would have been motivated to modify the process of Kubota by heating the photosensitive material at a temperature of 120.degree. C. or

Art Unit: 1792

above in order to thereby improve the resistance of the coating because Ikeda suggests such a step.

### ***Response to Arguments***

5. Applicant's arguments filed 11/16/2009 have been fully considered but they are not persuasive.

6. Regarding the rejection of claims 10 and 12 under 35 USC § 112, first paragraph, the applicant submits "positive type photosensitive material" is adequately described in page 44, lines 24-26, which recite "Next, as shown in FIG. 9D, exposure is performed for the photodegradable positive resist layer 204 of P(MMA-MAA)". The examiner respectfully maintains that the term "positive type photosensitive material" is not associated with a heating temperature, and therefore, does not have support in the specification.

7. As to applicant's arguments about the use of diglyme solvent and control of the formation of scum, the examiner respectfully notes that the term control of the scum is not claimed by the applicant.

8. As to applicant's argument about the composition of Uozumi is usable in ink and one of ordinary skill in the art would not look to the components of Uozumi to modify the liquid discharge head of Kubota et al. '422, the examiner respectfully disagrees because Uozumi et al. (US 2004/0214945) teaches an epoxy resin containing cationically polymerizable composition that contain cationically polymerizable compounds and photopolymerization initiators are generally likely to thicken (paragraph 0007), and

Art Unit: 1792

further teaches “methods for improving storage stability of oxetane compounds (which are cationically polymerizable compounds) and inhibiting the thickening and gelation of the compound caused by external factors such as heat: for example, a method in which p-methoxyphenol, hydroquinone, catechol, phenothiazine or cupferron is used as a thermal polymerization inhibitor, a method in which a **basic compound** is used, and a method in which a straight-chain or branched-chain **amine** is used” (paragraph 0009).

The amine compound of Uozumi has a pair of non-shared electrons. It appears that the fact that Uozumi calls an epoxy resin containing cationically polymerizable composition that contain cationically polymerizable compounds and photopolymerization initiators an ink does not disqualify it from being called a resin containing cationically polymerizable composition which is related to what Kubota uses.

9. The instant office action has been updated to address applicant’s remarks.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1792

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MAHMOUD DAHIMENE whose telephone number is (571)272-2410. The examiner can normally be reached on week days from 8:00 AM. to 5:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. D./  
Examiner, Art Unit 1792

/Nadine G Norton/

Application/Control Number: 10/565,658

Page 12

Art Unit: 1792

Supervisory Patent Examiner, Art Unit 1792